Population-based trends in HIV incidence shortly before the introduction of PrEP: insights into the baseline need in non-MSM groups

Adamma Aghaizu, Daniela De Angelis, Jennifer Tosswill, Noel Gill, John Saunders, Charlotte O’Halloran, Gary Murphy & Valerie Delpech
Background

- HIV incidence is challenging to determine, due to the prolonged asymptomatic infection period.
- Current methods to determine the incidence are based on back calculation models of diagnosis data making it challenging to provide precise estimates for recent years.
- Biomarkers for recent infection are an alternate method which could address this limitation of the back calculation method.
- Understanding incidence in key populations may help equitable delivery of HIV Pre-Exposure Prophylaxis (PrEP) and monitoring of progress towards elimination goals.
Laboratory methods

- Since 2014, Public Health England has undertaken testing for recent infection with HIV among new diagnoses using the Limiting Antigen Avidity Assay (Sedia BioSciences).
- Testing performed in about 50% of new infections.
- Results are linked to the national HIV database.
- An incident case is defined as:
  - avidity result <1.5 AND
  - no history of ARV treatment or AIDS diagnosis AND
  - viral load ≥400 copies/mL AND
  - CD4 >50cells/mm$^3$ at diagnosis.
Statistical methods

• Stratified extrapolation approach where the number of individuals diagnosed with a recent HIV infection are treated as a survey sample\(^1,2\)

• Each new diagnosis is weighted depending on available information on HIV testing history i.e. frequent testers are more likely to be diagnosed with recent infection and therefore, weighted less heavily

• These weights are used to infer incidence from the sample of recent infections to the whole population


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New HIV infections in heterosexual women

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- 95% credible interval of estimated incidence
- Estimated incidence RITA
New HIV infections in heterosexual men

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New HIV infections in MSM: biomarker estimates compared to CD4 back-calculation model

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Comparison of total new HIV infections and new HIV diagnoses

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Conclusions

- Of all incident HIV infections in 2017:
  - Heterosexual women accounted for approximately 15%
  - Heterosexual men accounted for approx. 11%
- A decline in incident HIV infections was evident in all population groups prior to the start of the PrEP Impact trial
- Availability of PrEP may help to accelerate the decline, but this depends on uptake in key populations
- Stratification by additional exposure categories (e.g. age and ethnicity) can help with equitable delivery of PrEP to underserved key populations
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